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CLAIMS:

1. A nozzle for an injection molding apparatus, comprising:

a nozzle body, said nozzle body defining a nozzle body melt passage, said nozzle body melt passage having an inlet that is adapted to be downstream from and in fluid communication with a melt source;

a heater that is connected to said body for heating melt in said nozzle body melt passage;

a tip, said tip defining a tip melt passage that is downstream from and in communication with said nozzle body melt passage, said tip melt passage having an outlet that is upstream from a gate in a mold component, said nozzle tip including a tip gap seal surface; and

a tip retainer, wherein said tip retainer retains said tip in position with respect to the nozzle body, wherein said tip retainer includes a tip retainer gap seal surface,

wherein said tip retainer gap seal surface and said tip gap seal surface are separated by a gap, and said gap is sized to inhibit the flow of melt therein.

2. A nozzle as claimed in claim 1, wherein said tip is made from a thermally conductive material.

3. A nozzle as claimed in claim 2, wherein said tip retainer is made from a material that is less thermally conductive than the material of said tip.

4. A nozzle as claimed in claim 1, wherein said tip retainer is configured to cooperate with said mold component to form a seal therewith to inhibit melt leakage therepast.

5. A nozzle as claimed in claim 1, wherein said tip retainer is configured to cooperate with said mold component to align said nozzle with respect to said gate.

6. A nozzle as claimed in claim 1, wherein the size of the gap is approximately .02 mm and approximately .07 mm.

7. A nozzle as claimed in claim 1, wherein the tip further includes a tip mechanical seal surface adjacent the tip gap seal surface and wherein the tip retainer further includes a first tip retainer mechanical seal surface adjacent the tip retainer gap seal surface, wherein said tip mechanical seal surface engages the tip retainer mechanical seal surface to form a mechanical seal, and wherein the tip and tip retainer mechanical seal surfaces are positioned behind said first and second gap seal surfaces with respect to exposure to melt.

8. A nozzle as claimed in claim 7, wherein the size of the gap is approximately .05 mm and approximately .35 mm.

9. A nozzle as claimed in claim 7, wherein the size of the gap is approximately .15 mm.

10. A nozzle as claimed in claim 1, wherein the tip includes a conical portion that is configured to extend into the gate.

11. A nozzle for an injection molding apparatus, comprising:

a nozzle body, said nozzle body defining a nozzle body melt passage, said nozzle body melt passage having an inlet that is adapted to be downstream from and in fluid communication with a melt source;

a heater that is connected to said body for heating melt in said nozzle body melt passage;

a tip, said tip defining a tip melt passage that is downstream from said nozzle body melt passage, said tip melt passage having an outlet that is upstream from a gate in a mold component, said nozzle tip including a tip sealing surface; and

a seal piece removably connected to said nozzle body, wherein said seal piece is configured to cooperate with said mold component to form a seal

therewith to inhibit melt leakage therepast, wherein said tip retainer includes a seal piece gap seal surface,

wherein said seal piece gap seal surface and said tip gap seal surface are separated by a gap, and said gap is sized to inhibit the flow of melt therein.

12. A nozzle as claimed in claim 11, wherein said tip is made from a thermally conductive material.

13. A nozzle as claimed in claim 12, wherein said seal piece is made from a material that is less thermally conductive than the material of said tip.

14. A nozzle as claimed in claim 11, wherein said seal piece is configured to cooperate with said mold component to align said nozzle with respect to said gate.

15. A nozzle as claimed in claim 11, wherein said seal piece retains said tip in position with respect to the nozzle body.

16. A nozzle as claimed in claim 11, wherein said tip is removably connected to said nozzle body, and wherein said seal piece and said tip are entirely free of contact with each other.

17. A nozzle as claimed in claim 11, wherein the size of said gap is approximately .02 mm and approximately .07 mm.

18. A nozzle as claimed in claim 11, wherein the tip further includes a tip mechanical seal surface adjacent the tip gap seal surface and wherein the tip retainer further includes a first tip retainer mechanical seal surface adjacent the tip retainer gap seal surface, wherein said tip mechanical seal surface engages the tip retainer mechanical seal surface to form a mechanical seal, and wherein the tip and tip retainer mechanical seal surfaces are positioned behind said first and second gap seal surfaces with respect to exposure to melt.

19. A nozzle as claimed in claim 18, wherein the size of the gap is approximately .05 mm and approximately .35 mm.

20. A nozzle as claimed in claim 18, wherein the size of the gap is approximately .15 mm.

21. A nozzle as claimed in claim 11, wherein the tip includes a conical portion that is configured to extend into the gate.

22. A nozzle for an injection molding apparatus, comprising:

a nozzle body, said nozzle body defining a nozzle body melt passage, said nozzle body melt passage having an inlet that is adapted to be downstream from and in fluid communication with a melt source;

a heater that is connected to said body for heating melt in said nozzle body melt passage;

a tip, said tip defining a tip melt passage that is downstream from and in communication with said nozzle body melt passage, said tip melt passage having an outlet that is upstream from a gate in a mold component, said nozzle tip including a tip sealing surface;

a tip retainer removably connected to the nozzle body, wherein said tip retainer retains said tip in position with respect to the nozzle body, wherein said tip retainer includes a first tip retainer sealing surface; and

a seal piece connected to said tip retainer, wherein said seal piece is configured to cooperate with said mold component to form a seal therewith to inhibit melt leakage therepast, wherein said seal piece includes a first seal piece sealing surface,

wherein said first seal piece sealing surface and said tip sealing surface are separated by a gap, and said gap is sized to inhibit the flow of melt therein.

23. A nozzle as claimed in claim 22, wherein said tip is made from a thermally conductive material.

24. A nozzle as claimed in claim 23, wherein said tip retainer is made from a thermally conductive material, and wherein said seal piece is made from a material that is less thermally conductive than the material of said tip retainer.

25. A nozzle as claimed in claim 22, wherein said gap size is approximately .02 mm and approximately .07 mm.

26. A nozzle as claimed in claim 22, wherein the tip further includes a tip mechanical seal surface adjacent the tip gap seal surface and wherein the tip retainer further includes a first tip retainer mechanical seal surface adjacent the tip retainer gap seal surface, wherein said tip mechanical seal surface engages the tip retainer mechanical seal surface to form a mechanical seal, and wherein the tip and tip retainer mechanical seal surfaces are positioned behind said first and second gap seal surfaces with respect to exposure to melt.

27. A nozzle as claimed in claim 26, wherein the size of the gap is approximately .05 mm and approximately .35 mm.

28. A nozzle as claimed in claim 26, wherein the size of the gap is approximately .15 mm.

29. A nozzle as claimed in claim 22, wherein the tip includes a conical portion that is configured to extend into the gate.

30. An injection molding apparatus, comprising:

a mold component and at least one nozzle;

wherein the mold component defines at least one mold cavity having a gate leading thereto,

wherein the at least one nozzle includes a nozzle body, a heater, a tip and a tip retainer,

wherein the nozzle body defines a nozzle body melt passage, said nozzle body melt passage having an inlet that is adapted to be downstream from and in fluid communication with a melt source;

wherein the heater is connected to said body for heating melt in said nozzle body melt passage;

wherein the tip defines a tip melt passage that is downstream from and in communication with said nozzle body melt passage, said tip melt passage having an outlet that is upstream from one of the at least one gate, said nozzle tip including a tip gap seal surface; and

wherein the tip retainer retains said tip in position with respect to the nozzle body, wherein said tip retainer includes a tip retainer gap seal surface,

wherein said tip retainer gap seal surface and said tip gap seal surface are separated by a gap, and said gap is sized to inhibit the flow of melt therein.

31. A nozzle as claimed in claim 30, wherein said tip is made from a thermally conductive material.

32. A nozzle as claimed in claim 31, wherein said tip retainer is made from a material that is less thermally conductive than the material of said tip.

33. A nozzle as claimed in claim 30, wherein said tip retainer is configured to cooperate with said mold component to form a seal therewith to inhibit melt leakage therepast.

34. A nozzle as claimed in claim 30, wherein said tip retainer is configured to cooperate with said mold component to align said nozzle with respect to said gate.

35. A nozzle as claimed in claim 30, wherein the size of the gap is approximately .02 mm and approximately .07 mm.

36. A nozzle as claimed in claim 30, wherein the tip further includes a tip mechanical seal surface adjacent the tip gap seal surface and wherein the tip retainer further includes a first tip retainer mechanical seal surface adjacent the tip retainer gap seal surface, wherein said tip mechanical seal surface engages the tip retainer mechanical seal surface to form a mechanical seal.

and wherein the tip and tip retainer mechanical seal surfaces are positioned behind said first and second gap seal surfaces with respect to exposure to melt.

37. A nozzle as claimed in claim 36, wherein the size of the gap is approximately .05 mm and approximately .35 mm.

38. A nozzle as claimed in claim 36, wherein the size of the gap is approximately .15 mm.

39. A nozzle as claimed in claim 30, wherein the tip retainer includes a second tip retainer gap seal surface and wherein the mold component includes a mold component gap seal surface around each gate, and wherein the second tip retainer gap seal surface and the mold component gap seal surface are separated by a second gap, wherein the second gap is sized to inhibit the flow of melt therein.

40. A nozzle as claimed in claim 39, wherein the tip includes a conical portion that is configured to extend into the gate.

41. A nozzle as claimed in claim 40, wherein the nozzle and the mold component together define a chamber surrounding the gate, and wherein the tip retainer further includes a first mechanical seal surface, wherein said mechanical seal surface is adapted to engage a mechanical seal surface on the mold component, and wherein the first and second mechanical seal surfaces are positioned behind said first and second gap seal surfaces with respect to the chamber.